

Borough of



Cheltenham.

ANNUAL REPORT

OF THE

Sanitary Condition, &c.

OF THE

Borough of Cheltenham,

FOR THE YEAR 1894.

BY

J. H. GARRETT, M.D.

Licentiate in Sanitary Science University of Durham.
Diplomate in Public Health University of Cambridge.

MEDICAL OFFICER OF HEALTH.

"Salus Populi Suprema Lex."

PRINTED BY ORDER OF THE SANITARY AUTHORITY.

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GEORGE F. POOLE, 15, BENNINGTON STREET.

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Borough of Cheltenham.

Public Health Committee.

MR. COUNCILLOR J. C. GRIFFITH, (CHAIRMAN).

MR. ALDERMAN G. NORMAN.

MR. COUNCILLOR LLEWELLYN DAVIES.

MR. COUNCILLOR M. DAVIS.

MR. COUNCILLOR F. FEENEY.

MR. COUNCILLOR S. LENTHALL.

MR. COUNCILLOR J. V. MOLES.

MR. COUNCILLOR E. PARSONAGE.

THE MAYOR (ALDERMAN E. B. WETHERED) *ex-officio*.

TOWN CLERK—MR. E. T. BRYDGES.

BOROUGH SURVEYOR—MR. JOSEPH HALL.

Medical Officers' Department.

CHIEF INSPECTOR OF NUISANCES: A. E. HUDSON.

ASSISTANT INSPECTOR: J. H. LONG.

2ND ASSISTANT INSPECTOR: E. JONES.

MEDICAL OFFICER OF HEALTH: J. H. GARRETT, M.D.



*To the Chairman and Members of the
Public Health Committee.*

GENTLEMEN,

I have the honour to present to you my Annual Report for the year 1894. The year has been fully as busy an one as any that has preceded it, not so much on account of the occurrence of cases of Infectious Disease, which happily show a falling off in numbers, but chiefly on account of work of a more voluntary nature, undertaken with a view of improving the condition of the town, and thereby lessening our future liabilities, in regard both to infectious and other diseases.

To give to Cheltenham the benefits of all the most modern sanitary appliances, to put into force the special powers that at some cost and trouble have been obtained for the town, and to carry into effect some much needed reforms, have been the objects which during the past year as previously we have constantly held in view, and considerable progress has been made in several directions.

The Statistics for the year 1894 include for the first time those of the extended Borough, portions of the suburban districts of Leckhampton and Charlton Kings having been added to our Borough just prior to the commencement of last year.

The year was not unfavourable in regard to any excessive illness, and the death rate for the year is low, lower

than for many years past. In our chief residential Wards the death rate would compare favourably with that of any other similar districts in the country.

Towards the close of the year we had the misfortune to lose our Chief Sanitary Inspector, Mr. Seth Lewis, who was appointed an Inspector under the London County Council. Mr. Lewis was a very trustworthy and zealous official and one that we should have preferred to have kept in Cheltenham. Mr. A. E. Hudson was appointed in his stead to begin work with the new year.

We are indebted as usual to Mr. R. Tyrer, of the Modern School for the Meteorological Returns for the year, which will be found appended to this Report.

I must acknowledge the hearty assistance I have received as usual from the Town Clerk, Mr. E. T. Brydges, and the Borough Surveyor, Mr. J. Hall, in carrying out the work of the past year.

Improvements effected and Work done during the past year.

*Summary of Work done by the Health Department during the year
ending Dec. 31st, 1894, drawn up by Inspector of Nuisances.*

Houses and Premises Inspected	...	...	...	...	...	3922
Including { Ordinary General Inspections	...	...	...	...	...	2010
{ House-to-house Inspection of Central Ward (<i>special</i>	...	...	...	...	...	1780
{ <i>record</i>)	...	...	...	...	...	132
{ " " East Ward	...	...	...	...	...	1574
Houses and Premises re-inspected after issue of Notices	...	...	...	...	...	74
Complaints in Writing received during the year	...	...	...	...	...	224
Notices issued bearing Signature of Inspector of Nuisances	...	...	...	...	...	501
" " " Town Clerk	...	...	...	...	...	220
Samples of Water collected for Analysis	...	...	...	...	...	10
Water Cisterns Removed or Repaired	...	...	...	...	...	64
Drains Repaired, Cleansed, Trapped and Ventilated	...	...	...	...	...	24
Brick Drains Removed	...	...	...	...	...	6
Cesspools Abolished	...	...	...	...	...	20
Sink and other Waste Pipes disconnected from Drains	...	...	...	...	...	45
Water Closets Cleansed, Repaired and Ventilated	...	...	...	...	...	117
New Water Closets provided	...	...	...	...	...	248
Waste Preventing Flushing Cisterns affixed to w.c's.	...	...	...	...	...

Urinals Built, Reconstructed and Cleansed	12
Accumulations of Manure or Refuse Removed on Notice	27
Receptacles for Stable Manure provided, or brought up to requirements of Byelaws	35
House Floors, Surfaces of Yards, and Areas Repitched	16
Roofs, Eaves Gutters, &c. Repaired	12
Houses Cleansed and Lime Washed	43
Soil Pipes provided and Ventilated	30
Work Rooms Ventilated	3
Stoneware Gully Traps fixed to Drains	214
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New Ash Receptacles provided... ..	96
Houses Closed as unfit for Human Habitation	23
Bakehouses Limewashed on Notice	28
Nuisances from Overcrowding Abated	8
„ Keeping Animals „	28
„ Smoke „	6
„ Insufficient w.c. Accommodation Abated	28
Manhole Disc Chambers provided	13
Intercepting Traps Fixed to House Drains	41
Houses and Premises Inspected for Sanitary Certificate. Drains all Tested by Water Test	44
Certificates issued by Inspector	33
Houses Visited as to Infectious Disease	157
Notices sent to Parents <i>re</i> Infectious Disease	85
Notices sent to Schools „ „	90
Houses Disinfected after „ „	140
Rooms „ „ „	161
Articles of Clothing, Bedding, &c. Disinfected	1531
Loads of Clothing, &c., Disinfected by private request	6

The foregoing List shows an increase in work upon previous years. It will be observed that the number of complaints received has been few in comparison to the work done, but experience shows that the absence of complaints is no guide in respect to the necessity for sanitary improvements.

House-to-house Inspection. — The systematic house-to-house inspection of the poorer parts of the town has proceeded. The Central Ward was finished during the year and the East Ward begun. This inspection has disclosed numerous defects and requirements in regard to water supply, flushing apparatus, houses in a filthy and unwholesome state, defects of drainage, overcrowding, &c. With regard to flushing apparatus one owner who came into court through having neglected to comply with the notices served upon him to affix flushing cisterns, raised the contention that the closets in his house did not come within the meaning of

water closets because they had no water supply to them. With the exception of a few far away in the rural part of the borough, the closets in Cheltenham are all water closets, all being connected with the sewers and dependent upon a proper supply of water for their efficient use.

Iron D or Dip Traps.—This kind of trap is everywhere to be found in the Borough, it being the kind that used to be commonly put in wherever a surface trap was required. It is a most inefficient and dangerous contrivance. The iron trap is generally set in the middle of a stone to which the rim is faultily joined. The consequence is that the whole trap very quickly becomes loose, and ventilates the sewer round its edges. These traps are being gradually replaced by stoneware gullies with iron grids.

Brick Drains.—A good many old square brick and stone drains remain, and occasionally a cesspit is discovered generally connected with the sewer on the one side and the house drain on the other. These are abolished whenever found.

Receptacles for Stable Manure.—Between two and three hundred new receptacles have been erected in the last $2\frac{1}{2}$ years. In places here and there about the borough a few others may be found to be required, or to be so altered and improved as to comply with the bye-laws.

New Water Closets.—So many as 117 new water closets have been provided in the year. In the poorer districts much more of this work remains to be done, and whenever possible, one closet to each house should be insisted upon. There are a good many instances in Cheltenham where one closet is used in common by two or three houses.

The Common Lodging Houses have been kept well inspected by day and night. The sanitary condition of the outside premises of several of them have received attention during the year, and the Borough Surveyor has made a Specification for the improvement of two of them. I am having them all re-measured with a view to prevent overcrowding, and a proper separation of the different lodgers.

The Bakehouses have been inspected personally by myself as well as by the Inspectors and have been kept well limewashed and as clean as possible. It is a too frequent custom in our town for the cellars of small houses to be used for bakehouses, the ventilation in some being in consequence not so good as it should be. Without contravening the sections dealing with Bakehouses contained in the Factory Acts, it is possible for bakehouses to be other than quite satisfactory. Probably a system of licensing bakehouses might in time remedy this and lead to the construction of better places for making bread.

Meat Inspection.—The butchers shops have been visited on Saturday nights and at other times, but no meat was seized during the year. An increased quantity of foreign meat was imported into Cheltenham during the year, and sometimes on a Saturday night this is sold very cheaply. The chief importer has set up freezing apparatus upon his premises which enables him to keep the meat for a lengthened period. On a Saturday night very much more foreign meat is to be found in the shops than that of English origin. The best method of inspection of foreign meat would seem to be to have it very carefully examined by experts at the port of landing, and every carcass or quarter certified by the inspector; the certificate to be produced to the Health authorities at the place of sale before the meat is cut up.

Factories and Workshops Act.—The old list of Factories and Workshops in the Borough being imperfect is being amended, and although there are not many important factories or workshops in Cheltenham, there are a number of small places that come under the definition. In conjunction with the Factory Inspector for the District, I hope henceforward to bring the whole of these places under a stringent supervision. A few notices were served during the year requiring alterations, lime-washing, &c., of workrooms.

Dairies, Cowsheds, and Milkshops.—The cowsheds in the borough are in process of being measured up with the object of preventing overcrowding of which we have had some instances. The new byelaws require 800 cubic feet per animal. In 1894 there were 18 new applications for registration as Purveyors of Milk. 13 of these

were ultimately placed on the register after certain notices for necessary alterations had been complied with. The other 5 were not registered.

An occasion occurred for bringing into operation Sec. 8 of the Cheltenham Improvement Act which requires milk sellers to furnish a list of their customers when the milk supply is suspected of being the cause of an outbreak of an infectious disease. Suspicion fell upon a milk supply in connection with an outbreak of diarrhœa, but when the enquiry was extended to the whole of the houses supplied, as well as to other houses, no ground for the suspicion was found.

Disinfection.—The Steam Disinfector has been kept in constant use disinfecting bedding and clothing after Scarlet Fever. The bedding and clothing of the two cases of Small-pox that occurred, as well as some very filthy bedding found in connection with other cases of infectious disease, were burned in the Destructor, compensation being given in some cases to the owners. Sulphur fumigation of the most thorough kind was practised after every case, and cleansing and limewashing ordered after infectious disease when needed.

Collection of Ashes and House Refuse.—The clause in the Cheltenham Improvement Act, 1889, as to the provision of covered moveable receptacles for ashes and house refuse, where no such receptacle exists, or only such as is unsuitable for the purpose, has been put into operation in a systematic way for the first time during the year, and a good many notices were issued requiring receptacles to be provided of such a size and sort as recommended by the Borough Surveyor. Sometimes when a row of cottages have had access to a common yard, a brick ashbin has been allowed to be built for common use. As a general thing, however, it is rather to be advised that every house should have its moveable ash receptacle, in which case the responsibility as to the condition of the receptacle and its contents rests with the individual householder. The use of moveable receptacles of a definite size also secures the frequent and regular collection. They must also lead to a saving of time in the collection, the ashes from every house being quickly handled and emptied into the carts.

The Destructor continues to do good work. The Borough Surveyor reports that 8,281 loads of house refuse were last year treated in it. The destruction of the decomposable organic matter in house refuse is a very important matter, and the use of these destructors is a great advance upon the older system, still in vogue in many towns, of tipping the untreated refuse into old clay pits or natural depressions of the surface, and the ground thus levelled up has been too frequently used for building sites. The unhealthy character of dwellings built upon such sites has had unhappy demonstration in many towns.

The Inspection of Houses for a Sanitary Certificate.—The system adopted just previous to the commencement of last year, of granting sanitary certificates for any dwelling house upon the request of owner, occupier, or agent, and upon payment of a fee varying from 5s. to 21s. according to the rental of the house, has hitherto worked well. Out of 44 applications that were made during the past year 33 certificates have been granted, and unless the work for inspection was new, considerable alteration and repairs were generally found necessary to bring the premises up to the requirements. In many cases it was found that the house drain leaked badly when filled with water, and this required for its rectification the exposure of the drain, and sometimes its entire relaying.

The *modus operandi* of the inspection is as follows : The person interested makes his application and pays his fee in advance. A man from the Borough Surveyor's Department thereupon stops the drain with an inflation air bag stopper at the trap which cuts the house drain off from the sewer. Where there is no manhole to the trap the ground has to be opened up which may require some considerable amount of digging. It is insisted that the portion of drain from the soil pipe to the trap mentioned shall be so sound as to withstand the pressure of water from the surface level ; *i.e.*, the drain is filled to the level of the ground gullies. The soil pipe and house connections are tested with Kemp's drain ferrets. Old pan and container closets are abolished and everything in connection with the drainage of the house must be brought up to modern requirements before a certificate is granted. The certificate given is worded as follows :

No.

BOROUGH OF CHELTENHAM.

HEALTH DEPARTMENT.

Municipal Offices, Cheltenham,

.....189...

I hereby certify that the House and Premises being

were inspected, and the Drains and Sanitary Apparatus and Appliances thereof tested by me on the.....day of..... and that in my opinion, so far as could be ascertained, the Sanitary Condition thereof was satisfactory.

Sanitary Inspector.

Observations—

N.B.—This Certificate is not to be deemed to impose on the Cheltenham Urban Sanitary Authority or their Inspector any legal or other liability or responsibility.

This system should be appreciated by occupiers and especially by those in search of a residence, who before entering upon a lease or agreement require a safeguard as to the present sanitary condition of the house. This they may now get by demanding of the landlord the certificate granted by the responsible governing body of the town. The system also acts as a lever for the improvement of old property generally, as it leads to better work being done, for no builder will find it to his credit to have it proved that the house drain which he laid last year is at present leaking badly through faulty joints. Of course the matter requires the greatest care in working, and it is possible that in the end it may entail so much labour as to require the appointment of a special Inspector to attend to it. Such a requirement, however, should be viewed as proof positive of the success of the innovation, and be accepted in that light.

LIST OF HOUSES CERTIFIED TO BE IN A PROPER
SANITARY CONDITION DURING 1894.

<i>Situation of House.</i>	<i>Annual Value of House.</i>
	£
1, Imperial Square	60
32, Montpellier Terrace	39
20, Lansdown Crescent	60
Moreton House, London Road	45
3, St. Margaret's Terrace	60
Fawley Lodge, Lansdown Road	80
17, Pittville Parade	55
Eldon Lawn, Hewlett Road	24
Deanwood House	140
14, Lansdown Terrace	60
13, Montpellier Spa Buildings	60
Mostyn House, Hale's Road	28
Rockville	60
7, Lansdown Crescent	60
43, Lansdown Crescent	40
4, St. Phillip's Terrace	20
10, Promenade Terrace	65
Essex Villa, Pittville	80
Douglas Lodge	60
25, Promenade	60
Lismore Villas	45
22, Lansdown Crescent (a certificate for 2nd applicant)	50
22, Lansdown Crescent	50
1, Fauconberg Villas	90
18, Promenade	60
Clarence Villa	60
Lisle House	180
Cotswold Lawn	30
10, Montpellier Grove	45
16, Regent Street	40
14, York Terrace	60
2, Ashland Villas	40
1, Regent Street... ..	40

Work under Sec. 41 of the Public Health Act.

—This section has been found a very convenient one under which to work in cases of complaint, or in cases where the Inspectors have discovered serious defects in house drainage, &c. Instead of serving notices under Sec. 91 the carrying out of which will probably be partial and ineffective, the Inspector or Medical Officer of Health makes written application to the Sanitary Authority to empower the Borough Surveyor or Inspector of Nuisances to enter the premises, cause the ground to be opened if necessary, examine into the condition of the house and *prepare a specification* as to all necessary works. The application of this section has brought additional work upon the Borough Surveyor, but the carrying out of his specifications has resulted in the thorough improvement of the properties with which they dealt. This section applied in the above manner would appear to constitute one of the best powers conferred by the Public Health Acts for the improvement of defective house drainage, &c. It was put into operation 58 times during the year.

Legal Proceedings.

Prosecutions in connection with Scarlet Fever

—A summons was taken out against a parent for wilfully neglecting to notify to the Medical Officer of Health cases of Scarlet Fever occurring in his family. On visiting the house one desquamating child opened the door to me, and another was, after some attempt at denial on the part of the mother, discovered in a bedroom suffering a very marked attack, in the acute stage of the disease. A fine of 10/- was imposed.—Another prosecution was for exposure of the person of the defendant's son whilst suffering from Scarlet Fever. The boy at the outset of the symptoms was taken to a herbalist, and the parents, according to their own statements, were misled by what he told them. After staying at home for two or three days, the boy returned to work in an iron factory, the result being that the two boys who worked the one on either side of him contracted the disease, and were both notified as Scarlet Fever cases in due course, and were sent into hospital. This led to enquiry, and upon discovery the boy was peeling profusely on his hands and

feet, and was in a weakly convalescent condition. A history of rash and sore throat having occurred three weeks previously, was also obtained, and he was then removed to hospital. Defendant pleaded ignorance of the nature of the complaint and was discharged.

Summonses were also obtained in the following instances :

For keeping Pigs so as to be a Nuisance, and neglecting to comply with bye-laws as to manure receptacle.—The defendant was fined £1 and £1 10/- costs. Another similar case was withdrawn on defendant promising to make compliance.

For Overcrowding 2 cases. The cases were adjourned for magistrates' order to be complied with. One was complied with in the specified time. The other came again before the court and was fined 10/-

For neglect to comply with Notice to affix flushing cisterns to w.c's.—In the case of 4 defendants time was given for the work to be done, and it was done in the specified time. In one case a fine of 1s. and 7/6 costs was imposed and the work was then done. In one case a fine of 1/- and 6d. a day continuing penalty was imposed, and the work was then done.

For neglect to comply with requirements to drains, &c. made under Sec. 41 Public Health Act.—Time was allowed for the work to be done and it was done in the time specified.

For Magistrates' Order to close a polluted well ; also to affix flushing apparatus to w.c's.—The case was defended and witnesses brought into court, but the defendant then agreed to close the well and affix the flushing cisterns. Costs were allowed to the Corporation.

Magistrates' Orders were also obtained, one for the purpose of forcibly detaining in the hospital a small-pox patient. The man was a tramp, and threatened to take his departure from hospital whilst in an infectious condition.

The threat of being sent to prison had no terror for him. Another Order was obtained to enter the premises of a householder who had declined admission to the Inspectors and the Medical Officer of Health, the object of entry being to inspect as to the water supply.

The Public Abattoir and Private Slaughter Houses.

The management of the Slaughter Houses and all that pertains to the slaughtering of animals and the sale of meat continues to constitute a sanitary difficulty in the borough. A copy of the new bye-laws for private slaughter houses, which were sanctioned by the Local Government Board previous to the commencement of last year, has been sent round to every butcher using a private registered slaughter house, but the provisions contained in them have not in every case been obeyed even after repeated notices. There may be some slight improvement in the present over the past condition, but this, little as it is, can only be maintained by frequent inspection and agitation. Some of the 26 registered places are mere hovels, quite unfit for slaughter houses, and it is high time that the slaughtering of meat for sale in such places should be prohibited here and elsewhere. In this matter England appears to be in the rear of France and other European countries, and the question is assuming so acute an aspect that our Parliament would appear bound to legislate at no distant date to cause public abattoirs to be built and used in every town. At the present time some few towns have obtained powers by special Act to cause all the butchers to use an abattoir when built, but the building is delayed. Others, like ourselves, have begun by building an abattoir, to find that further powers are wanted to get the butchers to use it. That every town in the country should be obliged to enter upon the great expense and trouble of getting an Act of Parliament in order to be able to substitute a public slaughter house for private slaughter houses seems a hardship.

I find that my predecessor, Dr. Wright, in his Annual Report for 1882, after personally visiting the public abattoirs in this country, and gaining information from Local Government Board officials and others, wrote : " The erection of an abattoir has become a great public necessity which requires the immediate attention of the Town Council to consider and settle."

Slaughter houses are a nuisance to the locality in which they are placed for any one of several reasons. It is not a pleasant sight to the neighbours to see animals driven to slaughter, or to hear them in the lairs, and the driving of cattle through the streets and alleys by which some of the places are approached is liable at times to be fraught with danger. Slaughtering cannot take place without a considerable amount of decomposable matter being left about the generally ill constructed floors and walls. The drains, the actual condition of which is often a matter of speculation and doubt, are liable to be put to the strain of carrying off a great deal of offensive matter. We have bye-laws in regard to the length of time animals may be kept fasting and the manner in which they shall be killed, but the impossibility of seeing these bye-laws carried out, or of obtaining proof of their contravention, renders them of little use. The most important sanitary advantage, however, in having all animals whose flesh is intended for food slaughtered at one place, is the possibility of an inspection of the animals and of meat which such a system affords. A constant and efficient inspection of animals and meat in the private slaughter houses is quite impossible owing to the distance they are apart, and the fact of the animals being brought in and slaughtered at all times. The knowledge obtained by recent investigations as to the communicability of tuberculosis, and the well-known communicability of other diseases to mankind from the ingestion of diseased flesh is of an importance that is not likely to be exaggerated, and according to the experience obtained on the continent, and by the Jews who have practised a kind of meat inspection from time immemorial, it is quite clear that the slaughtering of diseased animals and the consumption of their flesh as food is of frequent occurrence. These considerations, and the fact that the butchers who have registered private slaughter houses will never leave them in favour of the Abattoir, of their own accord, have led me recently

to advise that further powers be sought to cause the abolition of private slaughter houses, and to render it penal to slaughter animals whose flesh is for sale, in any other place than such as is assigned by the Corporation. The trade interests of the butchers must be rightly considered. It appears they do not like the idea of the inspection and registration of their animals and meat. They say their private slaughter houses are more conveniently situated for them, and that they object to using a slaughter house in common with one or more other butchers, owing to gossip taking place between the men of the several masters. Wherever powers to close private registered slaughter houses have been obtained, provision has always been made for compensating the butchers who are obliged to forego the use of their private places. In considering what compensation should be paid, the fitness or unfitness of the places for their purpose should be as fairly considered as the loss which will be entailed on the butchers by the prohibition of their further use. The more thoughtful men amongst the butchers are hardly likely to expect that the private interests of their class will be allowed to stand in the way of a thing so plainly to the public advantage as the establishment of central abattoirs.

The Superintendent of the Abattoir reports that during last year there were fewer beasts, calves and lambs killed in the abattoir ; but the diminution in the numbers of these animals was more than counterbalanced by the increase in the number of pigs and sheep. About half the total number of pigs killed, however, were the property of one pork butcher and were killed for export.

The actual number of animals killed in the abattoir last year was as follows. These numbers probably do not represent more than an eighth of those killed in the borough, the remainder being killed in private slaughter houses.

Beeves	222
Calves	248
Sheep.....	2377
Lambs	332
Pork Pigs	1539
Bacon Pigs	245

The fees due for the use of the Abattoir as above amounted to £93 14s. 11d.

The list of butchers who used the Abattoir during the year is as below :

Mr. Ashcroft, High Street, pork only.
 Mr. Canack, High Street, pork only.
 Mr. E. Davis, Christchurch Parade.
 Mr. W. Davis, High Street.
 Mr. Dufour, High Street, pork only.
 Mrs. Jenkins, High Street, pork only.
 Mr. Lawrence, Mountpleasant, pork only.
 Mr. Lane, High Street.
 Mr. Moody, Winchcomb Place.
 Messrs. Page & Co., High Street, pork only.
 The Meat Kings, High Street.
 Mr. F. Waghorne, Tivoli Buildings.
 Mr. G. Willis, New Street.
 Mr. Gibbins and Mr. Mills (now gone away).

Some private persons also made occasional use of the Abattoir chiefly for killing and dressing pigs.

The Water Supply.

Since the commencement of last year water from the river Severn has been introduced into the borough from Tewkesbury. The Corporation of Cheltenham previously possessed waterworks at Tewkesbury by which that town had been supplied for a long time. When it was determined that a supplemental supply for Cheltenham should be brought in from Tewkesbury, two new filters were made there on the most approved principle, and together with the filters that already existed these are now in use for the filtration of the Severn water. The filtered Severn water as it arrives in Cheltenham is very bright, and on chemical analysis proves to be of more constant and superior quality than that delivered from Dowdeswell. The two waters are conveyed in separate pipes, and a few houses in the town have both laid on, but the chief use to which the Severn water has hitherto been put has been for all rougher purposes of street watering, baths, and the like, and a saving of the Dowdeswell water has been the result. During last autumn the latter supply fell very low, and but for the Severn supply we must either

again have resorted to the sandbed or have suffered a shortness of water as in the previous year. It is satisfactory to feel that Cheltenham need never again fear a water famine. Some irregularity in the purification of the water at Dowdeswell has occurred ever since those works were made, owing to an insufficiency of filter area, and of storage capacity. It is very necessary that this water should be efficiently filtered, and reports upon the matter urging the necessity of adopting some additional means of purification at Dowdeswell were late in the year presented to the Water Committee by the Borough Surveyor and myself. Before taking any decided action in the matter, which was calculated to lead to a considerable expenditure of money, the Committee took advantage of the presence of Professor Percy Frankland in the town to consult him as to the necessity, and the best means of further purification of the Dowdeswell water. The independent report of Professor Frankland is just to hand, and coincides exactly in its results and recommendations to the advice we had given. In regard to the water supply from shallow wells in the borough, a strong representation was made by me to the Council as to the urgent necessity for closing these wells, and getting a constant supply of water laid on to properly flush the w.c's. and drains. This representation took the form of the following Special Report :

A SPECIAL REPORT UPON THE SUPPLY OF WELL WATER TO THE NUMEROUS HOUSES IN CHELTENHAM.

TO THE PUBLIC HEALTH COMMITTEE.

GENTLEMEN,

I beg leave to give you some facts in regard to the supply of water to a certain portion of the Inabitants of Cheltenham from shallow wells. I have had a house to house inspection made of the North and Central Wards where the greatest number of wells were known to be in use, with a view of ascertaining the actual number of houses supplied by wells, and I have also made an estimate of the number of houses supplied by wells in the East and South Wards. There are few wells in the other two Wards of the Town, viz., the West Ward and the Middle Ward.

The approximate number of houses supplied by wells in the four Wards is as set forth below. The result of the inquiry shows that fully 3,000 houses are still supplied by wells, representing a population of 14,000, or nearly a third of the population of the Borough.

Ward	No. of Houses supplied by Wells	No. of Wells
North Ward	1317	915
Central Ward	916	815
South Ward	492	?
East Ward	370	?

The major portion of the houses supplied by well water includes chiefly those of the poorer sort. It was to the interest of the old Water Company to get the houses of greater rateable value supplied first, and since the acquisition of the Waterworks by the Corporation the extension of the public supply to the poorer houses has proceeded slowly.

The wells are nearly all used by the aid of pumps, but from the seven draw wells that were found, some information has been obtained of the depth of the wells and of the present depth of water which they contain. It will be remembered that the wells are chiefly sunk in the drift sand which overlies the clay. The sand no doubt varies in depth, but generally speaking the depth of sand is nowhere very considerable. In these hollows of the clay which are filled up with sand the water collects by drainage from the surface.

The situation and depth of the seven draw wells are indicated below. The measurement was made on April 21st.

Locality of Well	Depth from surface of ground to bottom of Well	Depth of Water in Well
3, Elm Street	11ft. 9in.	4ft. 9in.
55, Worcester Street	12ft. 2in.	1ft. 2in.
29, Russell Street	14ft. 6in.	1ft. 6in.
4, Millbrook Street (not in use)	18ft.	11ft
Marsh Gardens	9ft. 5in.	1ft. 5in.
Crab Tree Piece	10ft. 2in.	5ft. 8in.
Brookbank Cottage	12ft. 0in.	6ft. 0in.

The water in all the wells is loaded with lime salts so as to be excessively hard, and the invariable presence of large quantities of Nitrate is evidence of the large amount of organic material with which the water has been in contact. A great proportion of the well water contains solid material in quantity equivalent to upwards of 10 grains in each half pint.

With old sewers and house drains running through the sand in close proximity to the wells, and with much surface refuse within a few feet, it is impossible for the water to escape organic pollution, and the numerous analyses I have made simply afford proof of what through previous experience has become a foregone conclusion.

The quality of water in these wells is subject to peculiar and dangerous variations. On several occasions my attention has been directed to the condition of the water from a pump which has suddenly assumed a peculiar appearance, and on examination it has been found to be teeming with bacterial life and otherwise impure. It is my experience that this water is injurious to health, causing diarrhœa and probably other illness.

There was ample evidence to show that the outbreak of Typhoid Fever last year was connected with well water, and when Typhoid has previously occurred in the town, the proportion of cases occurring in houses supplied by wells has been by far the greater.

The Closets in the town are now all connected with the sewers and are water closets, but where the water supply is from wells the closets are very badly flushed, and as the drains in most instances have little fall, they not unfrequently become choked for want of proper flushing.

In the interest of the public health it is essential that the town water be supplied for drinking purposes, and that the house drains and w.c.'s of these 3,000 houses be at the same time properly flushed by flushing cisterns, as provided for in the Cheltenham Improvement Act.

Instead of dealing with the cases a few at a time, as heretofore, I advise you to deal with them in much larger numbers, so as to wipe off in as short a time as possible, what at present constitutes a great sanitary deficiency. To this end at the next and succeeding meetings I hope to lay before you some long lists of houses with wells requiring to be closed and flushing apparatus requiring to be affixed.

Yours faithfully,

J. H. GARRETT,

MEDICAL OFFICER OF HEALTH.

Opposition has arisen to the carrying out of my advice upon this matter. This opposition really originates with the owners of property who are called upon to make an expenditure in laying on the water of the town supply and putting up flushing cisterns to the w.c.'s. It has taken form however in a demand that the water shall always be analysed before a notice is served for the well to be closed. This constitutes a very serious hindrance to the prompt closing of these polluted wells. There are thousands of shallow wells in our town that we know are a very little way removed from such sources of pollution as leaky drains and sewers which pass through the shallow sandbeds in which the wells are sunk. The water of all these wells is loaded with nitrate, derived no doubt from the source mentioned and from surface filth. To make an analysis of every well in a street is a sheer waste of labour and time, and would cause a delay of years in work which is in urgent need of accomplishment. Many people appear seized of the fallacy that only by an analysis can evidence be obtained of the danger of drinking a well water, whereas it is now generally recognised that the best evidence lies in the surroundings of the well.

There were 473 new connections made with the water mains during last year. The greater proportion of these were made as the result of notices served upon owners to close wells and provide proper flushing apparatus to w.c.'s. but a considerable number were made through the voluntary application of owners. It is to be hoped that the people at large are gradually coming to see the enormous advantages of a supply of water from the public mains over that from a shallow well. The absurdity of drawing water from such a highly dangerous source as a shallow well surrounded by houses, when there is a water-main passing the door, ought to be apparent to everyone.

The Town Sewerage.

During the past year the condition of the sewers in the town and the advisability of making improvements in the sewerage in certain places has been discussed, and the Borough Surveyor was asked to make a report upon the matter. Some of the older sewers in the town were laid by a company or by private individuals, and afterwards came into the hands of the Corporation. At the present time the plan of the sewerage in the possession of the Corporation is imperfect, the position of certain of the old sewers in the Lansdown district and elsewhere not being marked upon it, an omission pertaining to the old management. The Borough Surveyor has reported that the main sewers are of the brick barrel type and very large. Most of the older branch sewers are also of brick and in some places they are laid with too little fall, the fall throughout the length of the sewer also being irregular. In some places owing to deficiency of fall, and imperfections in the form of the sewer there is a tendency for a deposit of sludge to collect at the sewer bottom. This was seen in the old sewers at the back of Cambray and elsewhere where the brick sewers have been replaced by much better sewers of stoneware pipe. The Borough Surveyor has also reported upon the desirability of replacing a considerable number of these old imperfect branch sewers with stoneware pipes, and the work which will lead to much labour and expenditure, should be undertaken as soon as possible. A satisfactory amendment of the present condition can only be accomplished by

proceeding systematically, and as a first step it would be best to ascertain the position and condition of the sewers which are not marked on our plans, so that we may be in possession of a perfect plan of the whole sewerage system. An examination into the condition of the branch sewers is also required and work should follow upon the recommendations of the Borough Surveyor, the examination and work extending gradually from one district to another. In this manner a good result would be ultimately obtained.

It would be difficult to find a system of thorough sewer ventilation that could be applied in our town. Surface ventilators are very objectionable in a town of the character of Cheltenham, and to effect the object by placing a large number of shafts in our public streets is difficult of execution, to say the least. Wherever a convenient spot can be found a ventilation shaft should be erected, so that pressure of sewer gas within the sewers may be prevented to the utmost extent possible. A more thorough flushing of sewers and house drains in many streets is very desirable, but can only be effected by laying on water from the public supply to those premises that now depend upon well water.

Vital Statistics.

Area and Population.—Just previous to the commencement of last year we took within our bounds portions of the suburban districts of Leckhampton and Charlton Kings, and the area of the borough is now 4,677 acres.

In my last two reports I estimated the population of the old borough at about 44,000. This approximates to the numbers counted at the 1881 census and is about 1000 more than was counted at the 1891 census. The large increase of students at the Colleges, the considerable diminution in the number of empty houses in the borough, and the fact of some new houses having been built, together with the natural increase in the population that has taken place, are sufficient in my opinion to account for an increase of the above-mentioned proportions. The Commissioner of the Local

Government Board estimated the population of the added districts at 4,600, since when there has been some increase in these districts.

The population of the extended borough is therefore in round numbers 49,000.

Births and Birth-rate.—The number of births was 1008, which gives us the low birth-rate of 20.57 per 1,000 living. Average birth-rate for previous 10 years 23.33.

Deaths and Death-rate.—The total number of deaths that took place in the borough was 755. From this number has to be deducted 23 that died in the Workhouse Infirmary and the General Hospital, and which came from outside our district. The net number of deaths due to us is therefore 732, which gives us a death rate of 14.93 per 1000 living. Average death-rate for 10 previous years on stationary population of 44,000 17.40.

Infant Death-rate.—There were 130 deaths in infants under 1 year old which gives us a death-rate per 1,000 children born of 128. Average infant death-rate for previous 10 years 148 per 1,000 born.

Zymotic Death-rate.—The death-rate from the seven chief zymotic diseases is .53 per 1000 living. Average rate for previous 10 years 1.02.

Table of Statistics for the last 10 years, shewing Deaths from Chief Zymotic Diseases, and Zymotic Death-rate, and Total Deaths and General Death-rate; also Total Births and Birth-rate per 1,000 living, (and under 1 year old) Infant

Death-rate per 1,000 children born. Population for first 9 years, 44,000, for 1894, 49,000.

	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894
Small Pox ... ..	...	...	...	...	...	...	...	...	...	...
Measles... ..	12	...	12	3	...	12	5	41	12	2
Scarlet Fever	1	1	2	1	...	...	1	7	3	7
Diphtheria	1	2	2	1	2	5	4	2	6	4
Whooping Cough... ..	6	...	1	10	8	4	1	4	...	3
Enteric and Continued Fevers	5	8	9	31	7	8	4	1	6	2
Diarrhoea	12	28	14	15	13	14	4	11	20	8
Total deaths from seven chief Zymotics	37	39	40	61	30	43	19	66	47	26
Death-rate from chief Zymotics	·84	·88	·91	1·38	·68	·97	·43	1·50	1·06	·53
Total deaths belonging to District	824	760	798	758	696	737	772	794	769	732
General Death-rate	18·7	17·2	18·1	17·2	15·8	16·7	17·5	18·0	17·4	14·9
Total Births... ..	1090	1116	1049	1033	991	955	987	943	993	1008
Birth-rate	24·7	25·3	23·8	23·7	22·5	21·7	22·4	21·4	22·5	20·5
Infant Death-rate (per 1,000 born)	147	143	156	157	137	155	132	135	167	128

Owing to additions to our borough from Leckhampton and Charlton Kings, the population of three of the six wards into which our town is divided has been considerably increased. To the Middle Ward has been added the districts known as The Park and Moorend, which contain a large proportion of good-class houses. This Ward in consequence retains its former character, remaining still the most favoured district in regard to the size of the houses contained in it. The death-rate for last year in this ward on a population of upwards of 9,000 is remarkable and almost unheard of, being only 6.65 per 1,000. The addition to the South Ward was of quite a different sort, including the old village of Pilley and other small houses. The addition to the East Ward was of a mixed character.

The death-rate last year of the whole of the added districts, reckoned on a population of 4,600, was 12.6.

DISTRIBUTION OF DEATHS IN WARDS AND IN INSTITUTIONS, WITH DEATH-RATE IN EACH WARD FOR YEAR 1894.			
Wards (excluding Institutions).	Population 1891 Census.	Deaths.	Death Rate per 1000 living.
North Ward.....	9,790	154	15.73
East Ward	8,242	121	14.68
Central Ward	6,553	104	15.87
West Ward	6,039	67	11.09
South Ward.....	8,020	115	14.34
Middle Ward	8,870	59	6.65
Institutions.			
General Hospital		49	
(including 12 not belonging to District)			
Workhouse		64	
(including 11 not belonging to District)			
Delancey Hospital.....		7	
Children's Home		1	
Nazareth House		11	
Pates' Alms House		2	
Female Orphan Asylum		1	

Zymotic Disease in 1894.—The number of notifications of cases of Infectious Disease received during last year were considerably fewer than in the previous year. The following table shows the whole of the cases notified :

CASES OF INFECTIOUS DISEASE NOTIFIED DURING 1894.					
Disease.	1st Quarter.	2nd Quarter.	3rd Quarter.	4th Quarter.	Total.
Scarlet Fever ...	31	29	28	59	147
Enteric Fever...	7	10	6	4	27
Diphtheria	7	4	11	4	26
Puerperal Fever	...	...	...	1	1
Small Pox .....	...	3	...	...	3

Scarlet Fever.—147 cases of Scarlet Fever were notified in the borough last year, as against 419 cases in the year previous when the numbers, as we may hope, reached a climax. It is only during the last five years that infectious diseases have been notified in Cheltenham, and previous to that we have no record of the exact number of cases that occurred. The lowest number notified in the last five years was in 1891, when there were 75 cases. It seems probable that in every large town the infection of Scarlet Fever like that of measles never becomes extinct. It is uncertain in what year our own town was last free of Scarlet Fever, but there have certainly been cases in every year for the last 20 years. An epidemic has from time to time occurred. After one epidemic it is not unusual for a comparatively quiescent period to intervene during which new susceptible material is growing up and ultimately we get another epidemic. We have lately had no such visitation, however, as that which occurred in 1876 when there were 96 deaths from Scarlet Fever in the year, and allowing it to have been of a tolerably virulent type, there must have been 1,000 cases at least. It is interesting to read Dr. Wright's Report for that year in which he attributes the spread of the epidemic to mild cases in children who were scholars in the denominational schools. In 1876 a letter was addressed to the managers of the schools upon the subject by the Medical

Officer of Health. It is only quite recently and since arriving at the same conclusion, and adopting the same course that I have noticed the action of Dr. Wright in regard to the schools nearly 20 years ago. Our attention was particularly awakened last year to the fact of Scarlet Fever spreading amongst children brought together in schools when it became necessary to close Baker Street Schools, owing to an extraordinary prevalence of the complaint amongst the children attending them. At the same time, I drew the attention of the managers of this school, in a letter I wrote to them, to certain amendments as to cleansing, ventilation, and better warming, which appeared to me to be very necessary. The Council afterwards confirmed a minute of the Public Health Committee instructing the Town Clerk to address a letter to the managers of each of the elementary schools in the town admonishing them in regard to the general sanitary condition of the schools, and as to the numbers attending. It is said that the numbers in attendance at these schools is in no instance in excess of those allowed by the Education Department for the cubic space of the schools, but the fact is lost sight of that the limit is placed at a point beyond which it is considered so dangerous as to become illegal, and by no means at that point which a liberal consideration of the health and welfare of the children would dictate. I have no hesitation in saying that from a hygienic point of view several of the elementary schools here are overcrowded, and for the children to stay 5 or 6 hours a day in such close and filthy atmospheres is calculated to very much depress their vitality and render them subject to headaches and other temporary indispositions, and in the end to more serious afflictions.

The infection of Scarlet Fever was last year spread in other ways also than by the schools. In numerous instances, perhaps sometimes owing to the mildness of the attack, cases were overlooked until desquamation had been going on for some time, and were only discovered when in such a very advanced condition.

An effort has from time to time been made, by the circulation of handbills, to draw the attention of parents and responsible householders to their duties and liabilities in regard to the early notification of Infectious Diseases. The effect however has not been so good as could be desired.

SCARLET FEVER IN THE BOROUGH DURING
20 CONSECUTIVE YEARS.

Year.	Deaths recorded from Scarlet Fever.	Cases recorded as occurring in the Borough.†
1875	...	4
1876	96	393
1877	16	10
1878	...	6
1879	...	8
1880	5	43
1881	...	25
1882	1	21
1883	4	59
1884	3	49
1885	1	22
1886	1	17
1887	2	8
1888	1	...
1889	...	30
† 1890	...	93
1891	1	75
1892	7	264
1893	3	419
1894	7	147

† Before Notification, the Returns of Sickness were obtained from the Books of the Hospitals, Dispensaries, and Poor-law Out-patients, and do not represent all the cases that occurred in the town.

‡ Notification began this year.

Diphtheria.—Twenty-six cases of diphtheria were notified and there were only four deaths. There were however also two deaths from croup, which may or may not have been diphtheria, so ambiguous is the meaning of the term “croup.” The low case death-rate is suggestive that the twenty-six cases were not all true diphtheria, and in this connection may be noticed the recent question raised as to the advisability of appointing some person to make bacteriological examinations of material from the throats of doubtful cases. A species of bacteria known as the Löffler Klebs bacillus has been found in the false membrane that develops upon the mucous membrane of the nose, palate, fauces, larynx, &c., in such cases as have been called “true diphtheria.” These bacteria after cultivation upon some suitable

medium outside the human body, are found to be capable of producing false membrane and the other symptoms of "true diphtheria" when injected into a healthy animal, and are consequently proved to be the cause of the morbid condition. There is a milder kind of "diphtheria" in which little or no false membrane is developed but which is also a decidedly infectious complaint. There may be, in fact, several kinds of "diphtheria," or infectious sore throat, and it is known that at least two other kinds of micro-organisms besides the Löffler Klebs bacillus are liable to be found in such cases, and are also probably principal or subsidiary causes of the conditions. In regard to the notification of these infectious throat cases it is not at all to be desired that only such cases as are proved to have the Löffler Klebs bacillus present shall be notified. So far as the treatment by the new method of serum injections goes, however, it would be a useful piece of knowledge if we could learn when these bacilli are present, as it is against the effect of these bacilli in particular that the treatment is directed. The method which is suggested for adoption to settle the question of whether the bacilli are present or not, in its *primâ facie* aspect appears not unlikely to sometimes fail in its aim. Prepared pledgets of cotton wool are to be sent from the Central Laboratory to the medical practitioner, who is to swab the throat lesions with the pledgets, and it depends upon the adhesion of the bacilli to the cotton whether they will be discovered or not. Supposing they are not discovered it will hardly follow in every case that they are not present. It is also open to the practitioner to remove pieces of the false membrane and send them for examination, but in most of the doubtful cases there will be no membrane to remove, and in other cases though membrane be present it will be impossible to remove it. Examinations conducted in a similar way to prove the absence of the bacilli, and the end of the infectiousness of convalescent cases, is likely to fail even more frequently. It seems to me, therefore, that the propositions flying abroad in regard to the diagnosis of diphtheria by bacteriological examinations are perhaps a little in advance of our knowledge of the subject, and a little wide of the practical requirements of the physician.

The new treatment of diphtheria is founded upon the observation and theory that one attack of such a

disease is protective of the person against a second attack, and this by reason of the development in the blood of a material which is antagonistic to the growth of the specific bacilli, and antidotal to the effect of the poison produced by these bacilli. The bacilli growing in the body produce a toxin or poison, and the symptoms of the disease are the result of this toxin. The ultimate result however in those patients who recover from the disease, is the production in the blood of a resisting substance or anti-toxin, which neutralizes the effects of the toxin and prevents the further growth of the particular bacillus. It may be presumed that the blood of a person just recovered from diphtheria contains the anti-toxin of diphtheria, and if his blood were passed into the blood vessels of a person suffering from diphtheria, the anti-toxin would moderate the symptoms. A horse can be caused to be affected by diphtheria by injecting beneath his skin doses of a cultivation of the Löffler Klebs bacillus. A very virulent cultivation is used full of the toxin of diphtheria. In order not to kill him small quantities are at first injected, and later on larger doses. Ultimately the horse becomes immune from the effects of diphtheria however many of the bacteria are introduced into his system. This result can be effected at shortest in about a month though it may take longer. The blood of the immunized horse now contains the resisting material or anti-toxin, by virtue of which the toxin or poison of diphtheria can no longer produce its effects on him. The horse is bled and the blood allowed to clot, the fluid serum being removed from the clot. The serum which contains the diphtheria anti-toxin, is preserved, and used as a remedial agent against diphtheria in the human patient by being injected beneath his skin. A horse will yield more than a gallon of blood at a bleeding without being apparently any the worse for the loss when he is well fed, and consequently a considerable amount of serum can be obtained from a single horse. Of diphtheria cases treated in hospitals, the average number of deaths has of course been recorded, and it is possible to compare the per centage of deaths resulting under treatment by the old and new method. Evidence appears now to have been obtained to show that the death-rate can be reduced very largely, particularly when the remedy is applied before the patient is too far gone. From former experiences of new remedies one is not inclined to be

too sanguine of this latest wonderful discovery, but for all that there seems to be good ground, and great hope, that a means has become known of combatting one of the most terrible and fatal diseases to which mankind, and particularly the youthful part, is subject.

Small-pox.—Three independent cases of small-pox occurred during the year. They were each very promptly removed to the small-pox pavilion at the Delancey Hospital and thorough disinfection done, and in neither case was there any extension of the disease.

Influenza.—There were 10 deaths from Influenza last year, being the same number as occurred in the first year of the epidemic, 1890, and a great reduction on the numbers of the last three years. 70 per cent. of all the deaths that have taken place in Cheltenham since the commencement of the epidemic in 1890 have occurred in people over 50 years of age.

Years.	Deaths from Influenza.			
1890	10
1891	31
1892	34
1893	26
1894	10

Appended will be found Mr. Tyrer's Meteorological Report, the Summary of Analyses made by the Public Analyst, and some other Tables.

I am, Gentlemen,

Your obedient Servant,

J. H. GARRETT.

JANUARY 23RD, 1895.

INFECTIOUS DISEASES NOTIFIED IN 1894.
DISTRIBUTED IN WARDS AND INSTITUTIONS.

Ward.	Small Pox.	Scarlet Fever.	Diphtheria.	Enteric Fever.	Puerperal Fever.	Total Cases in each Ward.
North Ward .....	...	75	7	9	1	92
Central Ward .....	...	10	3	2	...	15
East Ward.....	1	13	4	6	..	24
South Ward .....	...	12	4	3	...	19
Middle Ward.....	...	16	7	5	...	28
West Ward.....	1	20	...	...	...	21
General Hospital .....	...	...	1	1	...	2
Delancey Hospital .....	...	1	...	...	...	1
Union Infirmary	1	...	...	1	...	2
Totals in whole of Borough...	3	147	26	27	1	204
Numbers treated in Hospitals in 1894.....	3	119	1	6	...	129

Uncertified Deaths in 1894.

There were 16 deaths during the year for which no medical certificate was given and in which no inquest was held. They are tabulated below according to causes assigned by Registrar.

Premature Birth resulting in death within 24 hours of birth	2 cases
Debility " " " "	4 "
Pneumonia (in young children)	2 "
Heart Disease, Heart Failure, Syncope at ages 48, 59, 75, 80, 89|... ..	5 "
Malformation of Heart (3 months old)	1 "
Epilepsy, age 46	1 "
Bronchitis, age 78	1 "
	<hr/> 16

Result of Coroner's Inquests, 1894.

44 deaths were reported as having been certified by the Coroner after an inquest.

Diseases of Brain, including Apoplexy and Paralysis	4
Convulsions	2
Epilepsy	1
Diseases of Lungs and Air Passages	4
Diseases and Injuries of Heart	10
Erysipelas	1
Blood Poisoning	1
Gastritis	1
Acute Rheumatism	1
Accidental Falls, causing Injuries to Brain and other organs	10
Accidental Burns and Scalds	2
Accidental Poisoning	1
Suicide by Shooting	1
" Poisoning	1
" Hanging	2
Murder by Injuries to Head and Throat	2
	<hr/> 44

Table No. 3.—Society of Medical Officers of Health

Cheltenham Urban Sanitary District.

DEATHS REGISTERED FROM ALL CAUSES DURING THE YEAR 1894

NOTE.—The Deaths of Non-Residents occurring in Public Institutions situated in the District are excluded, and the Deaths of Residents occurring in Public Institutions situated beyond the limits of the District are included.

[illegible]

(B) Table of POPULATION, BIRTHS, AND OF NEW CASES OF INFECTIOUS SICKNESS,
coming to the knowledge of the Medical Officer of Health, during the year 1894, in the
Urban Cheltenham District, classified according to Diseases, Ages, & Localities.

Names of Localities adopted for the purposes of these Statistics; Public Institutions being shown as separate localities.	Population at all ages		Registered Births	Aged under 5 or over 5	New Cases of Sickness in each Locality coming to the knowledge of the Medical Officer of Health.					Number of such Cases removed from their Homes in the several localities for treatment in Isolation Hospital.		
	Census 1891	Estimated of middle of 1894			Smallpox	Scarlatina	Diphtheria	Fevers		Smallpox	Scarlatina	Enteric or Typhoid
								Enteric or Typhoid	Puerperal			
Cheltenham (Extended Borough)...	47,514	49,000	1008	Under 5 5 upwards .....	... 2	42 104	6 19	1 23	... 1	... 2	29 89	1 5
General Hospital ...	...	...	...	Under 5 5 upwards .....	... ..	... ..	... 1	... 1	... ..	... ..	... ..	... ..
Delancey Hospital ...	...	...	...	Under 5 5 upwards .....	... ..	... 1	... ..	... ..	... ..	... ..	... 1	... ..
Workhouse ...	...	...	...	Under 5 5 upwards .....	... 1	... ..	... ..	... 1	... ..	... 1	... ..	... ..
TOTALS ...	47,514	49,000	1008	Under 5 5 upwards .....	... 3	42 105	6 20	1 25	... 1	... 3	29 90	1 5

Sale of Foods and Drugs Act.

*Summary of Articles submitted to the Public Analyst during the year
1894, with Results of Analyses.*

Samples all submitted by Superintendent Donald McRae.

Quarter ending March 31st.

<i>Articles submitted.</i>	<i>Result.</i>
6 Samples of Butter	All Genuine.
4 " Milk	"
4 " Lard	"
2 " Pepper	"
3 " Coffee	"
2 " Gin	"
3 " Whiskey	2 Genuine, 1 contained added water, Fined £1 and costs.

Quarter ending June 30th.

11 Samples of Butter	All Genuine.
1 " Milk	"
3 " Lard	"
1 " Coffee	"
2 " Pepper	"
1 " Rum	"
5 " Whiskey	4 Genuine, 1 Adulterated, Fined £2 and £1 0s. 3d. costs.

Quarter ending Sept. 30th.

4 Samples of Butter	All Genuine.
4 " Milk	"
4 " Lard	"
3 " Coffee	"
2 " Pepper	"
1 " Gin	"
2 " Whiskey	"

Quarter ending December 31st.

9 Samples of Milk,	all genuine.
3 " Lard	"
3 " Coffee	"
1 " Pepper	"
2 " Whiskey	"
1 " Gin	"
1 " Rum	"
4 " Butter,	3 genuine, 1 adulterated with 97 p. ct. of foreign fat. Fined £2, and £1 14s. costs.

THE METEOROLOGY OF CHELTENHAM.

Abstract of Meteorological Observations taken at the Modern School, Cheltenham, during 1894,
by RICHARD TYRER, B.A., F.R. Met. Soc.

Latitude 51° 54' 57" N. Longitude 2° 3' 21" W. Height above Mean Sea Level 190ft.

(The Instruments are all of the highest quality, and have been verified at Kew.)

Month.	Mean of Pressure at 9 a.m. and 9 p.m.	AIR TEMPERATURE.										Relative Humidity.		Rainfall.		Ozone 0·10
		9 a.m.	9 p.m.	Absolute Max. and Min.				Means of		9 a.m.	9 p.m.	Total Fall.	No. of Rainy Days.			
				Max.	Date	Min.	Date	Max.	Min.							
January	...	INCHES 29·834	° 38·7	° 38·9	° 43·6	° 34·0	° 55·4	11	° 13·8	6	° 87	° 89	IN 1·83	20	1·3	
February	...	30·040	41·3	41·0	47·7	35·2	53·8	7	20·5	21	80	85	1·82	16	2·0	
March	...	29·971	44·4	42·8	52·9	34·9	65·0	27	24·5	17	80	84	1·29	10	1·9	
April	...	29·857	49·9	48·0	58·8	40·2	70·0	11	30·5	20	81	85	3·20	16	5·5	
May	...	29·956	50·1	47·5	56·9	40·6	67·4	25	29·2	21	73	81	1·88	17	5·0	
June	...	30·013	58·2	56·7	65·9	48·5	82·1	30	36·0	1	77	82	2·01	13	3·3	
July	...	29·883	62·1	58·8	69·0	52·9	83·2	1	43·3	4	77	85	2·26	17	3·4	
August	...	29·930	58·4	56·2	65·3	50·1	72·2	30	39·6	21	80	89	2·45	20	2·4	
September	...	30·169	52·1	50·8	61·2	44·3	69·2	2	33·0	28	92	92	3·02	12	3·6	
October	...	29·918	48·8	48·8	55·3	43·1	64·0	11	28·4	22	91	93	3·22	19	1·5	
November	...	29·958	46·0	45·5	51·8	41·2	61·5	2	27·3	30	89	88	3·96	17	1·6	
December	...	30·032	40·6	41·0	46·2	35·0	54·5	13	18·0	31	90	91	2·18	17	1·6	
Totals	...	359·561	590·6	576·0	674·6	500·0					997	1045	29·12	194	33·1	
Means	...	29·63	49·2	48·0	56·2	41·6					83	87	2·43	16	2·7	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	

NOTES ON THE TABLES.

COLUMN 1 is the mean reading of the Barometer¹ at 9 a.m., and 9 p.m. corrected for temperature and reduced to mean sea-level.

COLUMNS 4 to 9.—The maximum and minimum thermometers are read and set at 9 p.m., and the readings entered to the same day.

COLUMNS 10 & 11.—The relative homidity is calculated by dividing the elastic force of aqueous-vapour at the temperature of the dew-point for the month by that at the temperature of the air.

COLUMN 14.—Observations are taken by means of prepared tests. The amount of colour produced after 24 hours' exposure in an Ozone-cage is compared with a scale of ten degrees of colour of increasing intensity.

WIND.

During 1894 the observations taken show that the general directions have been as follows:—

From the North ...	on 19 days	From the South.....	on 50 days.
„ North-East on 25	„	„ South West on 78	„
„ East..... on 7	„	„ West on 58	„
„ South-East on 25	„	„ North-West on 38	„

There were Calms on 60 days.

North Winds prevailed in May,	
South „ in April, November.	
South-West „ in January, February, June, December.	
West „ in March, May, July, August,	
North West „ in September, December.	
Calms „ in December.	

COMPARATIVE TABLE OF THE METEOROLOGY OF CHELTENHAM FOR THE YEARS 1878-94.

Year.	Atmospheric Pressure	AIR TEMPERATURE.				Humidity.		Rainfall.	
		9 a.m.	9 p.m.	Max.	Min.	3 a.m.	9 p.m.	Inches	Days.
	INCHES.	°	°	°	°	°/°	°/°		
1878	29.913	49.5	47.2	56.1	41.5	83	88	33.18	176
1879	29.944	46.2	44.4	52.2	38.5	87	89	32.63	212
1880	29.971	48.7	47.0	55.8	40.5	85	88	33.72	177
1881	29.957	47.9	46.1	55.0	38.9	82	85	25.28	185
1882	29.914	49.2	47.5	55.9	41.5	81	86	37.92	214
1883	29.964	48.7	46.9	55.6	40.6	85	89	29.93	204
1884	29.978	50.3	48.2	56.8	41.9	84	89	24.04	190
1885	29.930	48.0	46.5	54.8	40.0	84	87	26.45	193
1886	29.912	48.5	46.9	55.0	40.6	83	86	32.55	193
1887	30.029	47.3	45.5	55.3	38.6	80	83	22.78	153
1888	29.959	47.2	46.1	53.8	40.1	82	84	28.85	195
1889	29.971	48.5	47.1	55.4	40.6	84	87	27.07	181
1890	29.959	48.6	47.1	55.6	40.1	84	88	20.09	191
1891	29.957	48.1	46.4	55.1	40.0	83	87	33.14	192
1892	29.948	47.2	45.6	54.6	38.7	82	85	19.45	175
1893	29.990	50.7	48.9	59.1	41.3	81	83	19.91	169
1894	29.963	49.2	48.0	56.2	41.6	83	87	29.12	194
Means	29.966	48.4	46.7	55.4	40.3	83	86	28.01	188

The year is remarkable for the great variation in atmospheric pressure during the months of January, February, March, and October, November and December ; for the high mean temperature of the first four months, especially that of April, and also that of the last three, and the high direct solar temperature of January, April and November : for the severe frost in May, and the strong and disastrous gales of November and December.

The mean temperature of the summer months was low, and in consequence, though the spring opened with every prospect of as early a year as last, fruit was generally late in ripening, summer fruits being quite a month, and autumn fruits fully three weeks later than they were last year.

The rainfall of the first eight months, April excepted, was *below* the average, while that of the last four, December excepted, *above*. The rainfall for the whole year is 1.11 ins. *above*. Thunderstorms occurred on nine days, snow fell on seven days only, and there were gales on twenty-two days, chiefly at the beginning and at the close of the year. Very slight fogs occurred on fourteen days.

The mean temperature on the whole year is 48.9 deg., which is 1.1 degree above the average of the past seventeen years. The mean temperature of the first four months was 2.8 deg. *above* the average ; that of the five following 1.4 deg. *below*, and that of the last three 2.7 deg. *above*. The direct solar temperature was in every month *above* the average, and the mean is 6.6 deg. *above*.

JANUARY.—Atmospheric pressure was very irregular throughout the whole of the month. Range of pressure 1.228 ins. The weather during the first week was fine, with slight snowfalls and low mean temperature, and the ice was safe for skating from the 5th to the 8th. Then a rapid rise in temperature followed, the mean on the 11th being nearly as high as that of April. This comparatively warm period lasted till the 22nd: the rest of the month, though generally fine was somewhat colder. There were many very bright and sunny days throughout the month, and the direct solar temperature was very high. Mean temperature 38.8 deg., 2.2 deg. *above* the average of the past seventeen years.

FEBRUARY.—Atmospheric pressure was much disturbed, especially at the commencement and at the close : from the 14th to the 23rd it was high and steady. Range of pressure 1.338 ins. The weather during the early part of the month was warm and very pleasant, though there was a considerable amount of wind. From the 17th to the 24th it was low : snow lay on the hills and the water was covered with ice : the closing days of the month were very beautiful. Mean temperature 41.5 deg., 2.1 deg. *above*.

MARCH.—Atmospheric pressure was low and irregular during the first half of the month, high and very steady for the remainder. Range of pressure 1.302 ins. A beautiful month with bright, sunny days, and brilliant weather during the last week. In consequence, vegetation, as last year, was very forward : almond trees were in full bloom on the 7th, the hawthorn was in leaf on the 22nd, and the water was so warm that bathing in the lake was indulged in at the close of the month. Mean temperature 43.9 deg., 3.1 deg. *above*.

APRIL.—Atmospheric pressure was regular, though somewhat low, during the first half of the month, rose rapidly until the 20th, and was generally steady for the rest of the month. Range of pressure $\cdot 879$ ins. A remarkable month with respect to its high mean and direct solar temperature, the latter being 13.7 deg. *above* the average, and for its heavy rainfall, which was 1.30 ins. *above*. The early part of the month was characterised by brilliant weather and high temperature, reaching a maximum of 70.0 deg. on the 11th, Then followed a severe thunderstorm, with heavy rain and hail, and for the rest of the month the weather was considerably cooler. There were thunderstorms also on the 18th and 26th. Vegetation was still much in advance: horsechestnuts were in leaf on the 5th, and in bloom on the 16th: the oak trees were in leaf on the 22nd, and the hawthorn and laburnum in bloom on the 30th. Mean temperature 49.5 deg., 3.7 deg. *above*.

MAY.—Atmospheric pressure was very steady throughout the month. Range $\cdot 825$ ins. A month remarkable for its low mean temperature, lower than that of April, the coldest May, with two exceptions, for seventeen years. A severe frost occurred on the 21st, doing much damage to the fruit trees and to all tender plants' Though the shade temperature was low, that in the sun was high, being 4.5 deg. *above* the average. There were heavy thunderstorms at the close of the month. Mean temperature 47.8 deg., 2.8 deg. *below*.

JUNE.—Atmospheric pressure was remarkably steady throughout the month. Range of pressure $\cdot 737$ ins. The early part of the month was pleasant, though dull, and there was a heavy thunderstorm on the 4th, and a considerable amount of rain. Pleasant weather marked the rest of the month, and the last four days were bright and hot. Raspberries were just getting ripe at the close, quite a month later than last year. Mean temperature 57.2 deg., 0.5 deg. *above*.

JULY.—Atmospheric pressure, with the exception of a slight depression from the 8th to the 15th, was very steady throughout the month. Range of pressure $\cdot 913$ ins. The first was characterised by bright and very hot weather, followed by a fortnight of cool, but pleasant days, with frequent showers. Fine and warm weather, interrupted by a thunderstorm with heavy rain, closed the month. Mean temperature 60.9 deg., 0.6 deg. *above*.

AUGUST.—Atmospheric pressure was generally steady throughout the month. Range of pressure $\cdot 776$ ins. The weather was generally dull and unpleasant, and very low maximum during the day, though the nights were warm. There were, however, some bright and pleasant days. Thunderstorms, with heavy rain occurred on the 15th and 25th. The month closed with bright days. Mean temperature 57.7 deg., 1.9 deg. *below*.

SEPTEMBER.—Atmospheric pressure was very high and steady throughout the month. Range of pressure $\cdot 851$ ins. The weather during the first week was unsettled: there were thunderstorms on the 4th and 5th, and a very heavy rainfall on the 7th, the heaviest since 1891. After this the temperature at night fell considerably, the first ground frost occurring on the 11th. After the 21st there was a week of rainy weather, and the month closed with some beautiful days. Mean temperature 52.7 deg., 2.6 deg. *below*.

OCTOBER.—Atmospheric pressure was very steady during the first half of the month, but afterwards was very irregular, especially from the 23rd to the 28th. Range of pressure 1·453 ins. During the first fortnight the weather was fine, warm, and pleasant, with high night temperature at times, especially on the 11th, which was above the maximum of sixteen days in the month. The closing week was stormy and very wet. Limes and chestnuts were bare of leaves by the middle of the month. Mean temperature 49·2 deg., 1·5 deg. *above*.

NOVEMBER.—Atmospheric pressure was steady at the commencement, but was much disturbed between the 6th and the 16th: high and very steady for the rest of the month. Range of pressure 1·634 ins. For the first ten days the weather was pleasant, with considerable rainfall, chiefly at night. Very heavy rain, amounting to 2·26 ins., fell on the 12th, 13th, and 14th; this caused serious floods, and the strong gales at the same time caused much damage. The weather until the 25th, was fine and pleasant; the closing days of the month were gloomy, calm, and with slight fog. Mean temperature 46·5 deg., 4·0 deg. *above*.

DECEMBER.—Atmospheric pressure was high at the commencement, and from the 4th to the 16th, was generally steady. From that day to the close, the oscillations were very great, the fall from the night of the 27th to the morning of the 29th, being as much as 1·284 ins. Range of pressure 1·313 ins. The weather during the greater part of the month was very variable, bright, sunny days alternating with cold and damp ones. From the 10th to the 19th the minimum never fell below the freezing point. Strong gales occurred on the 22nd and 23rd, causing in many parts of the country, great loss both of property and life. The weather was also stormy towards the close, with low temperature and slight snowfall. Mean temperature 40·6 deg., 2·6 deg. *above*.

RAINFALL IN THE COUNTY OF GLOUCESTER IN 1894.

STATION.	OBSERVER.	RAIN- FALL	RAINY DAYS
		INCHES.	
Beckford	F. Slade	25·28	184
Moreton-in-Marsh ...	W. Arkell	31·30	175
Cheltenham	R. Tyrer	29·12	194
Bourton-on-the-Water ...	E. W. Kendall ...	31·94	181
Great Barrington ...	H. J. Barrett ...	31·97	183
Coleford	I. Trotter	47·52	234
Whitminster	F. A. Jones	33·93	192
R.A.C. Cirencester ...	C. C. Duncan ...	35·11	191
Berkeley	R. Shore	35·71	205
Lechlade	T. Arkell	30·80	174
Horcott	R. A. Iles	29·22	163
Over Court	R. C. C. Lippincott	40·68	213
Clifton	R. F. Sturge ...	41·26	200

The rainfall was very unequally distributed over the county, the fall at Coleford, Over Court and Clifton being heavy, that at Beckford, Cheltenham and Horcott, especially at the first station, being comparatively light. The number of rainy days also varied considerably, ranging from 163 at Horcott to 234 at Coleford. There were many more days of heavy fall both at Over Court and at Clifton than at Cheltenham or Beckford, at which stations the fall was spread over a comparatively greater number of days. The mean fall is 34.14 ins., which was exceeded at five stations only. The mean number of days is 191.

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